Master's Seminar banner

"A Trend Test for Association in Case-Control Studies with Pedigree Data"

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ABSTRACT

Association study is a powerful tool for finding genes for human complex diseases, such as hypertension and diabetes. There are several designs available to detect association in genetic studies, including both the traditional case-control design and family based design. We focus on a design that compares genotype frequencies between cases, sampled from multiple-affected families. Traditional case-control test doesn't allow for analysis of all affected individuals from each family, due to dependencies between individuals in a family. To maintain the nominal significance level, within-family correlations have to be accounted for in the analytical methods. Bourgain et al. (2003) account for correlations between individuals by calculating kinship coefficients which are used in constructing a quasi-likelihood score (QLS) test statistic. Their test can be used in any set of related individuals including large complex pedigrees. However, their test does require Hardy-Weinberg Equilibrium (HWE) in founders. In this study, we developed a trend test for association which has the optimality properties of Bourgain's method and does not require HWE in founders. Two statistics were proposed. The power of these statistics was compared by simulation. Finally this method was applied to a real data set.